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October 13, 2000

ATTORNEY DOCKET NO. 04350.0012-00000

**Box PATENT APPLICATION**  
**Assistant Commissioner for Patents**  
**Washington, D.C. 20231**

Re: New U.S. Patent Application  
(based on Provisional Appln. No. 60/159,507)  
Title: RAPID DEPLOYMENT HAZMANT CONTAINMENT DEVICE  
Inventor: Richard A. ESSER

Sir:

We enclose the following papers for filing in the United States Patent and Trademark Office in connection with the above patent application.

1. Application - 17 pages, including 2 independent claims and 20 claims total.
2. Drawings - 9 sheets of informal drawings (Figures 1 - 12).
3. Declaration and Power of Attorney.
4. Verified Statement (Declaration) Claiming Small Entity Status.
5. Please charge the filing fee of \$355.00 for this application to our Deposit Account No. 06-0916.

Applicant claims the right to priority based on Provisional Patent Application No. 60/159,507 filed October 15, 1999.

JC772 U.S. PTO  
10/13/00

ATLANTA  
404•653•6400  
PALO ALTO  
650•849•6600

JC920 U.S. PTO  
09/689615  
10/13/00

TOKYO  
011•813•3431•6943  
BRUSSELS  
011•322•646•0353

0969615-104300

PKS:tdp  
Enclosures

Applicant or Patentee: Richard Esser  
 Serial or Patent No.: Unassigned  
 Filed or Issued: Herewith  
 For: INVERTED V-SHAPED DISPLAY FRAMEWORK

Attorney's Docket No. 04350-0012

VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY STATUS  
 (37 CFR 1.9(f) and 1.27(b)) - INDEPENDENT INVENTOR

As a below named inventor, I hereby declare that I qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying reduced fees under section 41(a) and (b) of Title 35, United States Code, to the Patent and Trademark Office with regard to the invention entitled RAPID DEPLOY HAZMAT CONTAINMENT DEVICE

☒ the specification filed herewith, claiming priority to provisional Application Serial No. 60/159,507,  
 filed October 15, 1999

☐ Patent No. \_\_\_\_\_ issued \_\_\_\_\_

I have not assigned, granted, conveyed or licensed and am under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who could not be classified as an independent inventor under 37 CFR 1.9(c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern or organization to which I have assigned, granted, conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below:

☐ no such person, concern, or organization  
☒ persons, concerns or organizations listed below\*

\*NOTE: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

FULL NAME TVI Corporation

ADDRESS 7100 Holladay Tyler Road, Glenn Dale, MD 20769

☐ INDIVIDUAL ☒ SMALL BUSINESS CONCERN ☐ NONPROFIT ORGANIZATION

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

x RICHARD A. ESSER

Richard A. Esser

NAME OF INVENTOR

NAME OF INVENTOR

Signature of Inventor

Signature of Inventor

Signature of Inventor

Date

Date

Date

OF

RICHARD A. ESSER

FOR

RAPID DEPLOY HAZMAT CONTAINMENT DEVICE

RICHARD A. ESSER

FOR

# RAPID DEPLOY HAZMAT CONTAINMENT DEVICE

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202-408-4000

## RELATED APPLICATIONS

This patent application claims priority to Provisional United States Patent Application Serial No. 60/159,507, entitled "Rapid Deploy Hazmat Containment Device", filed on October 15, 1999, which is incorporated herein by reference.

## 5 BACKGROUND OF THE INVENTION

### Field of the Invention

The present invention generally concerns the design and operation of containment devices for hazardous materials. More specifically, the present invention is directed toward a portable rapidly deploying containment device for recovery and containment of hazardous materials.

### 10 Description of the Prior Art

Recovery and containment of hazardous substances is a continuing problem for industries that encounter spills, leaks, or other contaminated waste in their normal course of business. Indeed, the potential for a liquid chemical leak or spill exists wherever chemicals are used. Any industry handling potentially harmful material is subject to legal, economic and other consequences resulting from delayed, inadequate, or otherwise improper containment of hazardous chemical spills.

15 In the shipping industry alone, millions of dollars are spent rectifying situations involving hazardous chemical spills. For example, the trucking industry is continually faced with spills of fuel or other potentially hazardous chemicals. Because of government regulations, the costs involved in cleaning these spills range anywhere from a few hundred dollars to hundreds of thousands of dollars, depending upon the amount of hazardous material abandoned to the

20

environment. Rapid and efficient containment of these chemical spills is, therefore, not only a legal requirement but also an economic necessity. The concerns presented by hazardous chemical spills have created a specific need, at least in the shipping industry, for rapid and complete recovery of hazardous chemical spills.

5           Although there presently exist devices for containing hazardous spills in the shipping industry, the procedures and configurations of these devices are cumbersome and complex to manipulate and, therefore, impractical for immediate use. For example, many conventional containment devices are labor intensive and can require one or more workers specially trained in recovery of hazardous material to be available for deployment of the containment device. As  
10       such, these devices fail to provide a rapid means for containing hazardous spills. Conventional devices have also failed to provide a practical portable device capable of rapidly deploying from a closed compact configuration to an open erect configuration. Because of these and other deficiencies, the devices currently available for containment of hazardous materials are impractical for rapid and efficient recovery and containment of hazardous chemical spills.

15           In view of the limitations and complexity of existing containment devices, a need has arisen for a hazardous containment device which is simple in its application as well as construction, and capable of easily and rapidly deploying from a closed compact configuration to an open erect configuration.

#### SUMMARY OF THE INVENTION

20           The advantages and purpose of the invention will be set forth in part in the description which follows, and in part will be obvious from the description, or may be learned by practice of

the invention. The advantages and purpose of the invention will be realized and attained by means of the elements and combinations particularly pointed out in the appended claims.

To attain the advantages and in accordance with the purpose of the invention, as embodied and broadly described herein, the invention comprises a portable rapidly deploying hazardous material containment device which may be easily adapted to receive and contain a hazardous material. The containment device includes a framework structure that is movable between an erect open prism configuration and a collapsed compact configuration. In the prism configuration, the containment device includes a base and four side walls. The hazardous material is received and contained by a canopy disposed within the side walls of the device. To permit rapid deployment, the framework of the containment device comprises rods, where each rod is pivotally joined to another rod by a scissors-type connection intermediate the ends of the rod; and hubs, where each hub receives an end portion of at least two rods along a separate axis of the hub, such that the rods are pivotally joined to the hubs and each rod pivots in relation to the hub along a single axis of rotation. The rods rotate about this single axis of revolution from the collapsed configuration, where the rods are substantially parallel to one another, to the open erect configuration.

Additional objects and advantages of the invention will be set forth in part in the description which follows, and in part will be obvious from the description, or may be learned by practice of the invention. The objects and advantages of the invention will be realized and attained by means of the elements and combinations particularly pointed out in the appended claims.

It is to be understood that both the foregoing general description and the following

detailed description are exemplary and explanatory only and are not restrictive of the invention, as claimed.

#### BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are incorporated in and constitute a part of this specification, illustrate preferred embodiments of the invention and, together with the description, serve to explain the principles of the invention. In the drawings,

Fig. 1 is a perspective view illustration of an embodiment of a containment device in a closed compact configuration according to the present invention;

Fig. 2 is a perspective view illustration of an embodiment of a containment device in an open erect configuration according to the present invention;

Fig. 3 is a perspective view illustration of an embodiment of a containment device showing a disposable liner and dead stop according to the present invention;

Fig. 4 is a top view illustration of an embodiment of a containment device showing a wedge shaped insert according to the present invention;

Fig. 5 is a perspective view illustration of an embodiment of the containment device showing a wedge shaped insert according to the present invention;

Fig. 6 is perspective view illustration of an embodiment of the containment device showing a compartmentalized receptacle according to the present invention;

Fig. 7 is a perspective view illustration of an embodiment of a containment device showing inner and outer receptacles according to the present invention;

Fig. 8 is a perspective view illustration of an embodiment of a containment device



showing a drain outlet according to the present invention;

Fig. 9 is a perspective view illustration of an embodiment of a containment device showing two or more receptacles attached according to the present invention;

Fig. 10 is a perspective view illustration of an embodiment of a containment device showing hard fastening clips according to the present invention; and

Fig. 11 is a perspective view illustration of an embodiment of a containment device showing height adjustable straps according to the present invention; and

Fig. 12 is a perspective view illustration of an embodiment of a containment device showing two or more receptacles attached according to the present invention.

#### DESCRIPTION OF THE PREFERRED EMBODIMENT(S)

Reference will now be made in detail to the present preferred embodiment of the invention, an example of which is illustrated in the accompanying drawings. Wherever possible, the same reference numbers will be used throughout the drawings to refer to the same or like parts.

U.S. Patent No. 5,943,837 and pending U.S. Application entitled "Inverted V-Shaped Display Framework," filed September 20, 1999, are incorporated herein by reference. These references describe hubs, frames, and hub assemblies for quick erect devices.

In accordance with the invention, there is provided a portable rapidly deploying hazardous material containment device capable of receiving and containing a hazardous material. The containment device includes a frame that is movable between an erect open configuration and a collapsed compact configuration. In the erect configuration, the containment device

includes a base and four side walls, with a canopy disposed within the walls. To facilitate rapid deployment, the containment device comprises rods, where each rod is pivotally joined to another rod by a scissors-type connection intermediate the ends of the rod; and hubs, where each hub receives an end portion of at least two rods along a separate axis of the hub, whereby the rods are pivotally joined to the hubs and each rod pivots in relation to the hub along a single axis of rotation. This configuration allows the rods to rotate about the single axis of rotation from the collapsed configuration, where the rods are substantially parallel to one another, to the erect open configuration. To adjust the vertical height of the containment device in the erect configuration, a fastening mechanism may be affixed between opposing hubs of the erect unit. Alternatively, to limit the vertical compression of the containment device in the erect configuration, a stop mechanism may be affixed between opposing hubs of the erect unit.

As illustrated in the Figures, the containment device of the present invention is a complete integrated, modular structure, which is rugged, compact, and flexible in design. The containment device includes a frame that is designed for rapid setup as well as rapid breakdown. The device includes an exterior canopy that is preferably preattached to the articulate frame which expands to a vertical prism shape when erected. The containment device is self-supporting, which eliminates the need for supplementary erection devices, such as push poles and supplementary support devices, such as center poles.

The self-supporting nature of the containment device is derived from its articulate frame. The articulate frame consists of a plurality of rods or struts interconnected to hubs by pivotal joints. Each hub, which may interconnect with as many as four rods, includes an attachment mechanism which enables the exterior canopy to attach to a hub, depending upon whether the

hub is located on the upper or lower portions of the articulate frame. Examples of such attachment mechanisms include clips, buttons, snaps, hook and loop fasteners, and adhesives.

The structure of the containment device of the present invention is arranged such that the plurality of rods and hubs form a lattice framework. In the expanded configuration, this lattice framework forms a rectangular prism in which the canopy rests to form the basic receptacle for the containment device. In the collapsed configuration, the rods lay parallel to one another with groups of hubs disposed on both ends of the rods.

The unique design of the frame of the containment device of the present invention allows the device to rapidly deploy from the closed compact configuration 10, depicted in Fig. 1, to the open erect prism shaped configuration 12, depicted in Fig. 2. In the closed configuration, the containment device easily compacts in size, because of the unique relationship between hubs 12, 18 and rods 16. For example, when deploying the containment device from the collapsed to expanded configuration, it opens similar to an accordion, where the user need only lower hubs 12 positioned at the upper portion of the framework downward toward the lower portion of the framework. This unique configuration further provides the containment device, while in its expanded configuration, with enhanced rigidity through post-tensioning of hubs 12, 18 and rods 16.

In the compact configuration, the containment device provides the shipping industry with a unit that may be easily stored and transported. In the erect configuration, the framework of the containment device provides a durable lightweight receptacle, defined by the dimensions of the erected four side walls, where each wall is formed by the scissors-type connection between respective rods 16. Residing within these walls is canopy 14, which serves as the receptacle for

hazardous materials. Because canopy 14 receives and retains hazardous chemicals, it is preferred that it be constructed of a chemically resistive fabric or material. Canopy 14 preferably attaches to at least those hubs 12 positioned at the upper face of the framework in the erect configuration. Although canopy 14 may permanently attach to these hubs 12, it is preferred that canopy 14  
5 removably attach to hubs 12, by any conventional means, including, but not limited to clips, snaps, buttons, velcro, or adhesives.

The practical design of the containment device provides an easily deployable unit, which may be articulated to its erect configuration by a single individual, regardless of technical background. Once erected, the unit enjoys great mobility, because it is constructed of  
10 lightweight, durable materials, such as lightweight metals, plastics or composite materials. Indeed, a single individual may effectively transport and manipulate the unit at the spill site to best contain spills of hazardous materials (i.e. sliding the erect unit beneath a tanker or other similar equipment).

As illustrated in the Figures, various modifications can be made to the containment  
15 device of the present invention without departing from the scope and spirit of the invention. For example, as illustrated in Figures 3-10, the canopy section of the containment device permits a variety of modifications that increase the adaptability as well as the strength of the receptacle of the containment device.

As illustrated in Figures 3-5, the containment device may enjoy increased adaptability and  
20 strength in its expanded configuration by affixing various support structures into the receptacle region formed by the rectangular prism. For example, as illustrated in Figure 3, liner 22, preferably disposable, may be affixed into receptacle 23 to provide added strength as well as

adaptability, because liner 22 may be easily removed and replaced. Liner 22 may be affixed to the containment device using various methods, including clips, buttons, snaps, hook and loop fasteners, or adhesives. To further strengthen the receiving capabilities of the containment device, wedge shaped insert 26 of preferably hard material may be attached to the bottom of canopy 14 to protect canopy 14 from heavy objects placed in the containment device. A preferred configuration of wedge shaped insert 26 is illustrated in Figures 4 and 5. For additional strength, the containment device may be used in conjunction with hard fastening clips 50 that adhere to the side walls of the containment device in the open erect configuration, as illustrated in Figure 10. These clips 50 reinforce the connection between hubs 12, canopy 14, and liner 22.

In addition to strengthening the canopy, the containment device may be partitioned to retain differing types of hazardous material. For example, as depicted in Figure 6, the containment device may include receptacle 40 which is compartmentalized, such that when the containment device is deployed into its erect configuration there exists one or more receiving areas encompassed within the side walls of the unit. Furthermore, to offer increased safety in retention of hazardous materials, the receptacle may include one or more separate canopies. As designed, the containment device, in its open erect configuration, includes inner 41 and outer 42 compartments, each capable of receiving and retaining hazardous materials, as illustrated in Figure 7. For spills of various materials or of greater proportion, the receiving capabilities of the containment device may be easily expanded by attaching one or more units adjacent one another, preferably joined at the hub sections, as illustrated in Figures 9 and 12. Similarly, the rods may include a telescoping member that permits extension in the length of the rods, thereby, increasing the receiving volume of the receptacle region.

Regardless of the particular canopy configurations, hazardous material resident in the receptacle may be easily removed by a conduit or other conveying means attached to one or more outlets 44 or drain holes of canopy 14, as illustrated in Figure 8. Such removal capabilities increases the capacity of the containment device, because it permits draining of the receptacle region while simultaneously allowing the receptacle region to continue to receive hazardous materials.

The adaptability of the containment device may be further manipulated by controlling the vertical dimensions of the unit once erected. For example, to adjust the height of the erect containment device, adjustable straps 52, as depicted in Figure 11, may be affixed to opposing hubs 12, 18 of the device. These straps 52 may include a becket latch or other fastening system that allows the user to adjust the height of one or more corners of the containment device by adjusting the length of each strap 52. Alternatively, to control the height of the erect unit, dead stop 30 may be placed between opposing hubs 12, 18 of the containment device, as illustrated in Figure 3. In essence, dead stop 30 prevents the corners of the containment device from compacting in its vertical height beyond a predetermined distance.

It will be apparent to those skilled in the art that additional modifications and variations can be made in the containment device of the present invention and in construction of this device without departing from the scope or spirit of the invention. Further, use of the containment device is not limited to the shipping industry, as it may be used in any situation involving the receipt and retention of hazardous materials (i.e. decontamination showers for individuals and contaminated waste).

Other embodiments of the invention will be apparent to those skilled in the art from

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4	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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- 12 -

WHAT IS CLAIMED IS:

1. A rapid deploy containment device adapted to receive and retain a hazardous material, the containment device being moveable between an erect open configuration and a collapsed compact configuration, the containment device in the open configuration having a receptacle capable of receiving hazardous materials, the containment device comprising:

rods, each rod being pivotally joined to another rod by a scissors connection intermediate the ends of said rod;

hubs, each hub receiving an end portion of at least two rods along separate axes of each hub, said rods being pivotally joined to said hubs, where each of said rods pivot in relation to said hub along a single axis of rotation,

said rods being rotatable about the single axis of revolution from the collapsed configuration where said rods are substantially parallel to one another to the erect open configuration; and

a canopy connected to at least two hubs and residing in the receptacle of the erect containment device.

2. The containment device recited in claim 1, wherein each of said hubs includes flanges, said flanges receiving the ends of said rods.

3. The containment device recited in claim 2, wherein the end portion of each of said rods is pivotally joined to one of said flanges by a pin inserted through the end portion of said rod and received on said flange.

4. The containment device recited in claim 2, wherein at least two of said flanges lay substantially perpendicular to one another, whereby each of said hubs receives rods along a first



axis and a second axis perpendicular to the first axis.

5. The containment device recited in claim 4, wherein the ends of said substantially perpendicular flanges bend at right angles in either a clockwise or counterclockwise direction.

6. The containment device recited in claim 5, wherein the end portion of each of said rods is pivotally joined to said flange by a pin inserted through the end portion of said rod and received on two of said flanges.

7. The containment device recited in claim 1, wherein each of said hubs includes a base portion, the end portion of each of said rods being pivotally joined to said base portion by a pin inserted through the end portion of said rods and received on said base portion.

8. The containment device recited in claim 2, wherein said hub includes a base portion, said flanges projecting from said base portion.

9. The containment device recited in claim 1, wherein each rod is of substantially equal length and wherein said scissor connection is proximate the middle of each rod.

10. The containment device recited in claim 1, wherein at least two of said rods have a telescoping member, said rods having a hollow interior whereby said hollow interior slidably receives a small rod in said rod to provide extension of the containment device in the vertical and horizontal direction.

11. The containment device recited in claim 1, further comprising a fastening mechanism connecting the upper and lower portions of the erect containment device.

12. The containment device recited in claim 1, further comprising a stop positioned between the upper and lower portions of the erect containment device.

13. The containment device recited in claim 1, further comprising a liner positioned in

the receptacle adjacent said canopy.

14. The containment device recited in claim 1, further comprising an insert positioned in the receptacle proximate said canopy to strengthen said canopy.

15. The containment device recited in claim 1, wherein said canopy includes a partition creating at least two receptacles when the containment device is in the erect configuration.

16. The containment device recited in claim 15, wherein the partition creates inner and outer receptacles.

17. The containment device recited in claim 15, wherein the partition creates two receptacles of similar dimensions.

18. The containment device recited in claim 1, wherein said canopy includes an outlet adapted to drain any hazardous materials resident in said canopy.

19. The containment device recited in claim 18, wherein the outlet is configured to receive a conduit to facilitate draining of said canopy.

20. A rapid deploy containment device adapted to receive and retain hazardous material, the containment device being convertible between an erect open configuration and a collapsed compact configuration, the containment device in the open configuration having a receptacle region capable of receiving and retaining hazardous materials, the containment device comprising:

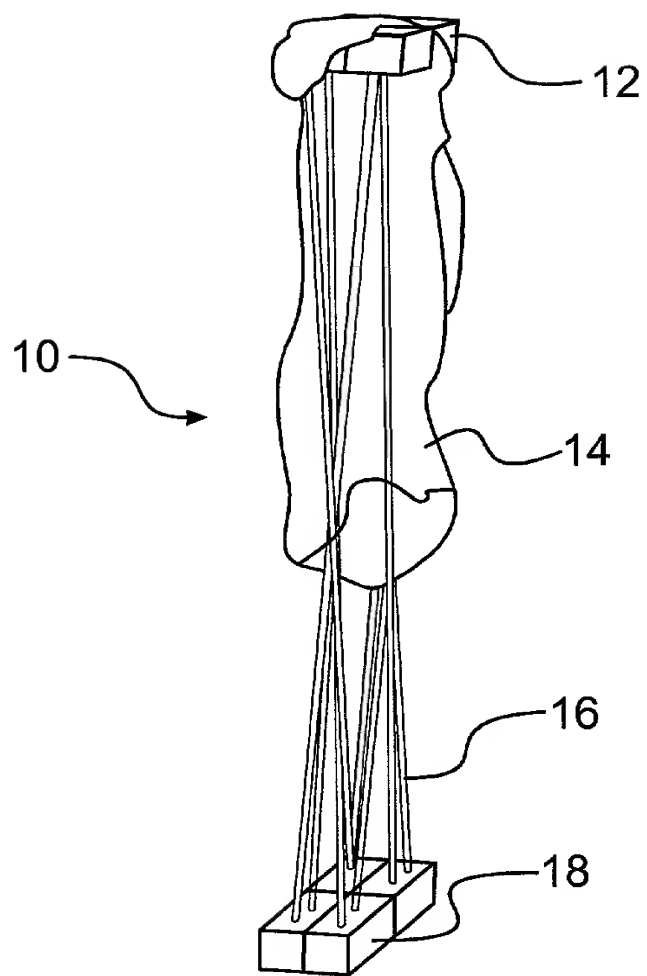
rods, each rod being pivotally joined to another rod by a scissors connection intermediate the ends of said rod;

hubs, each hub receiving an end portion of at least two rods along separate axes of each

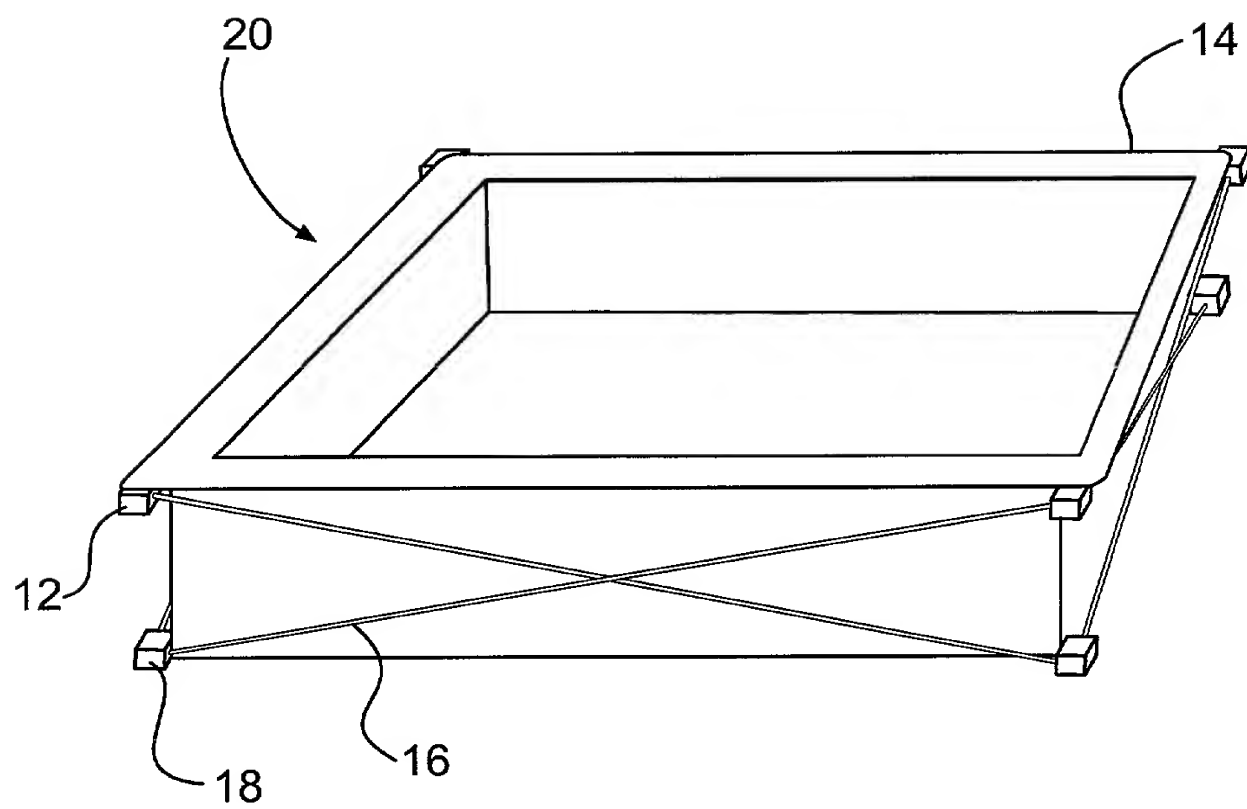


## ABSTRACT

A portable rapidly deploying hazardous material containment device is disclosed, which is adapted to receive and retain hazardous materials. The containment device includes a framework may be easily and rapidly manipulated between an erect open configuration and a collapsed compact configuration. The framework of the containment device includes rods, hubs, and a canopy. Each rod pivotally joins to another rod by a scissors-type connection intermediate the rod ends. In addition, the end portion of each rod pivotally joins to a hub, where each hub may receive a plurality of rods. As configured, each rod enjoys pivotal movement in relation to the hub along a single axis of revolution. The rods rotate about this single axis of revolution from the collapsed compact configuration, where the rods are substantially parallel to one another, to the erect open configuration, where the rods radiate outwardly from one another and the framework of the containment device includes four side walls. In this erect configuration, the containment device provides a frame for the canopy to reside and form a receptacle region for receiving and retaining hazardous materials.

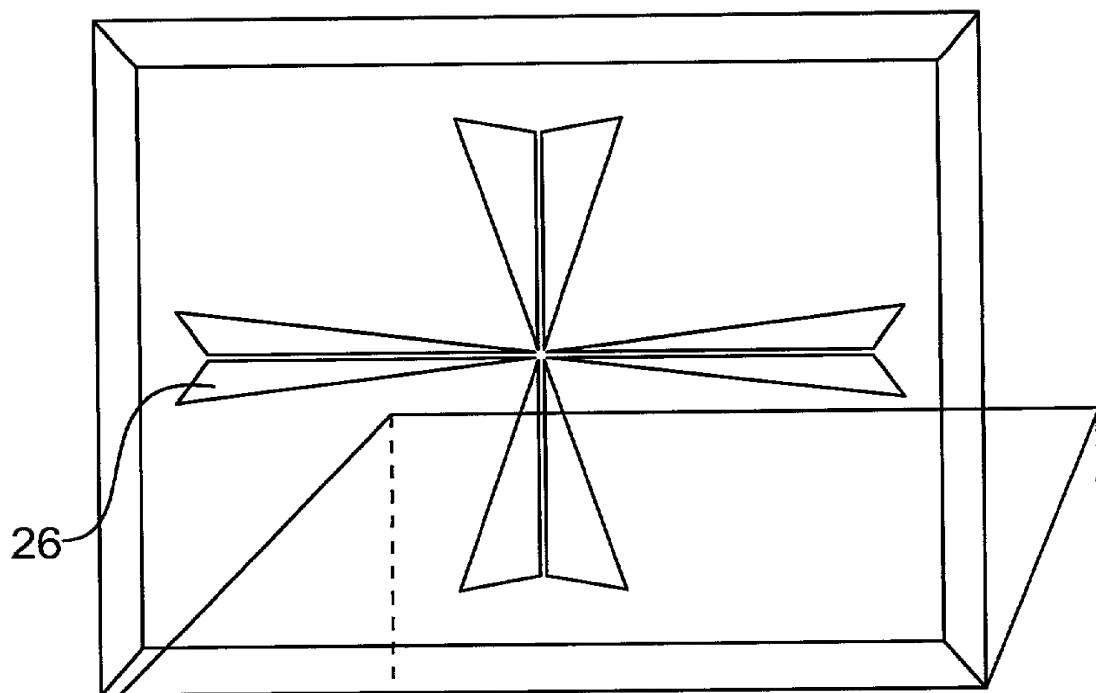


**FIG. 1**

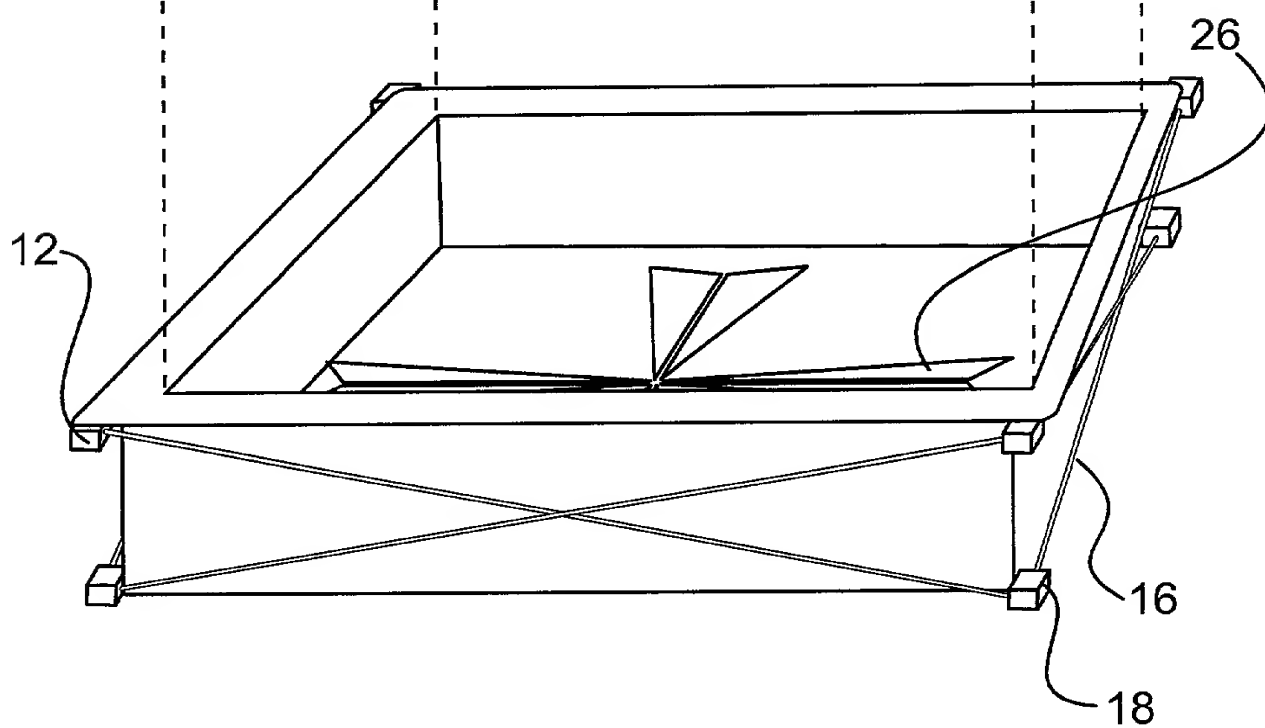


**FIG. 2**

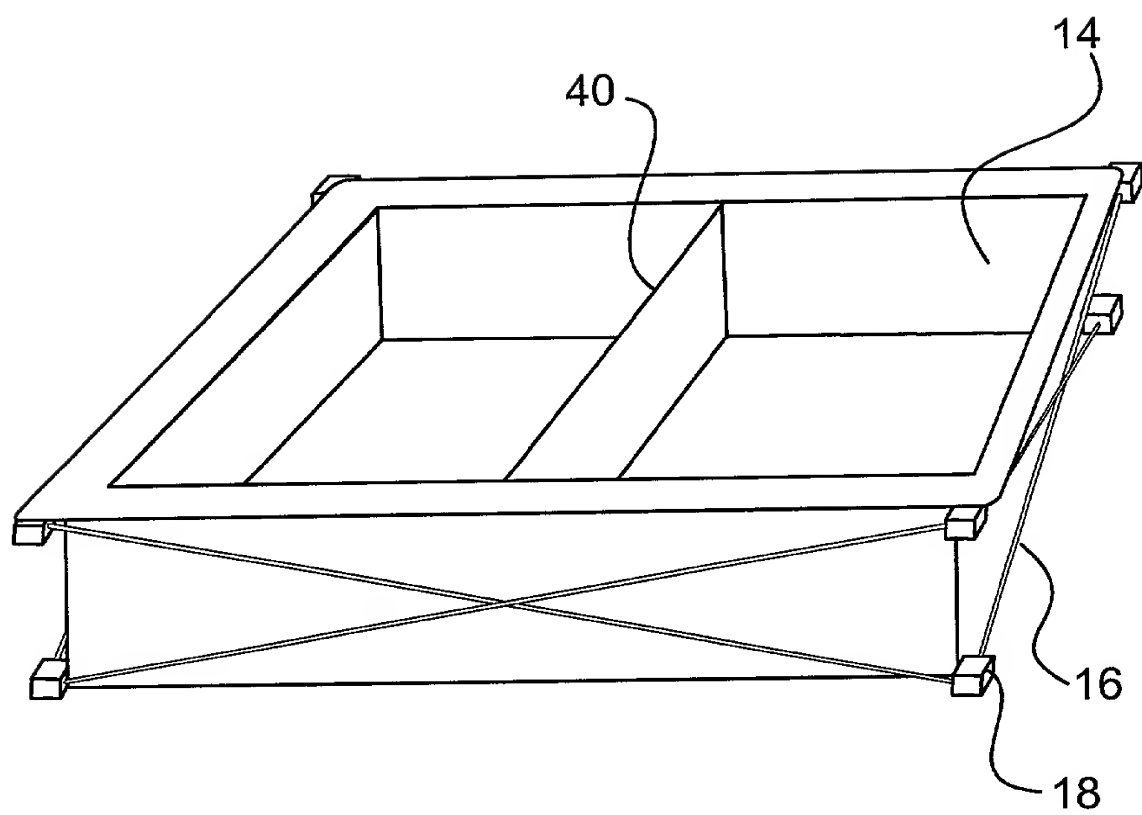




**FIG. 4**

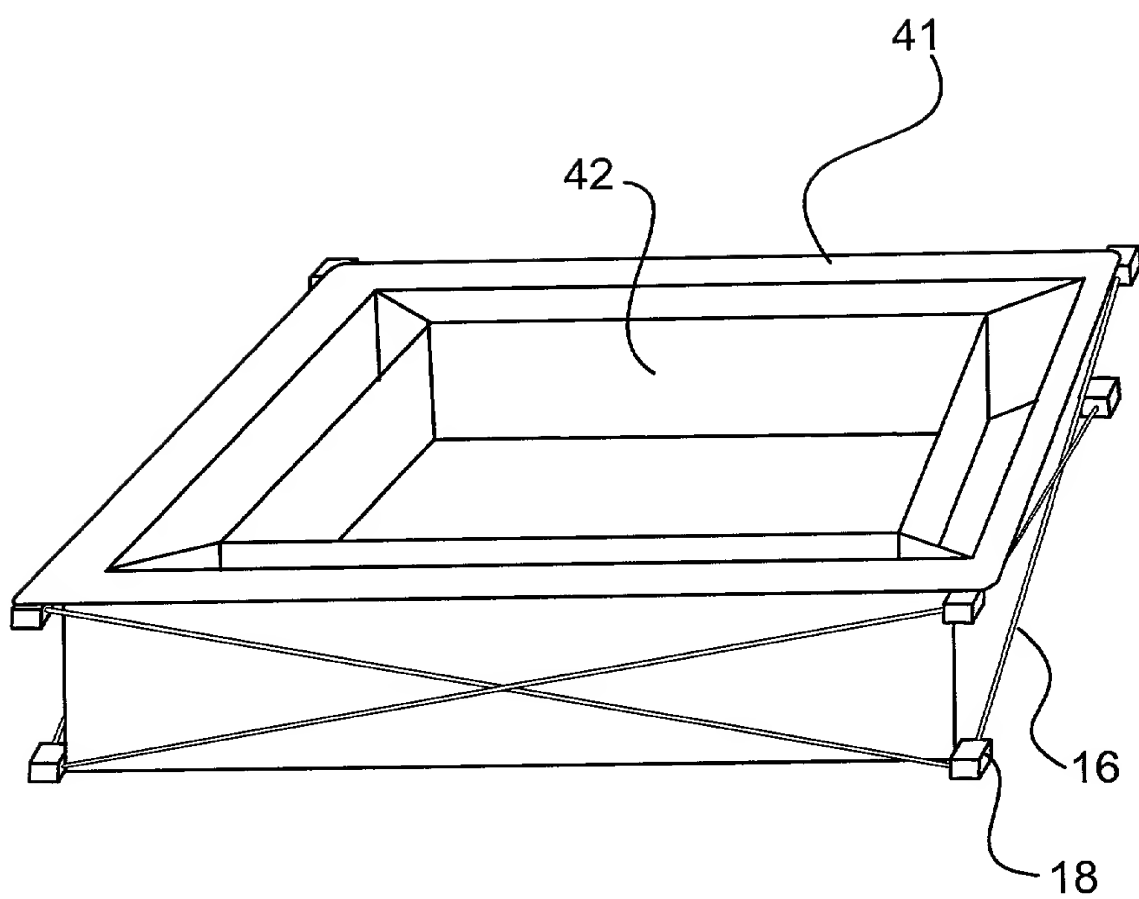


**FIG. 5**



**FIG. 6**





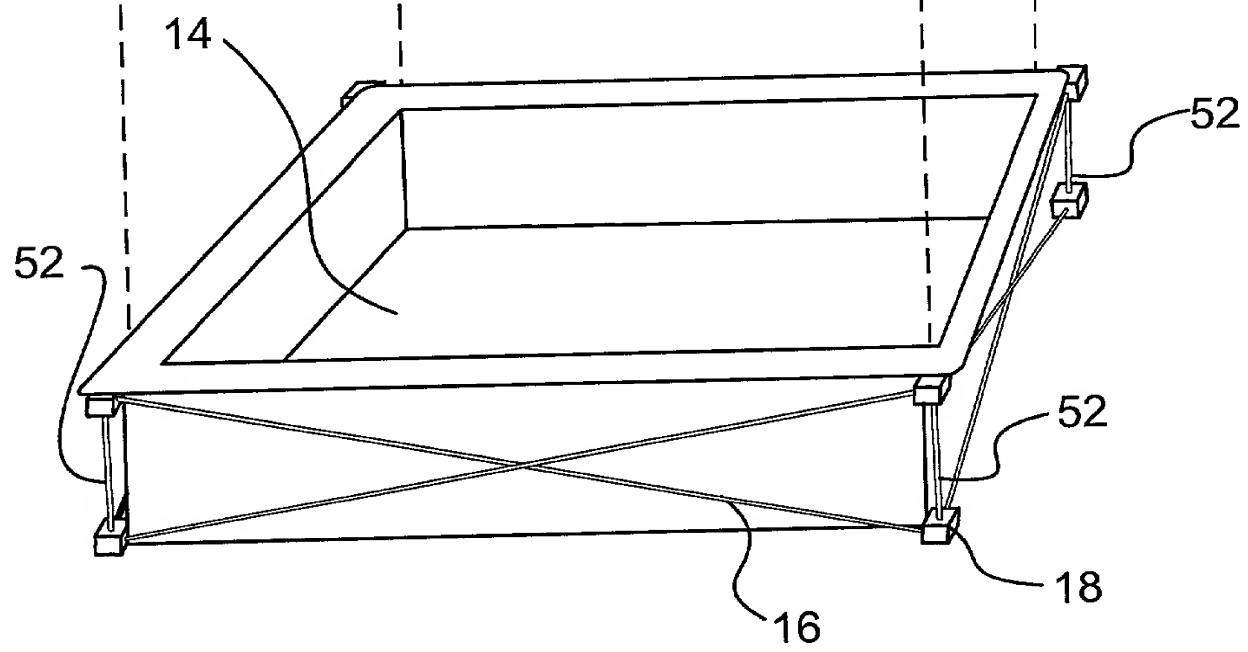
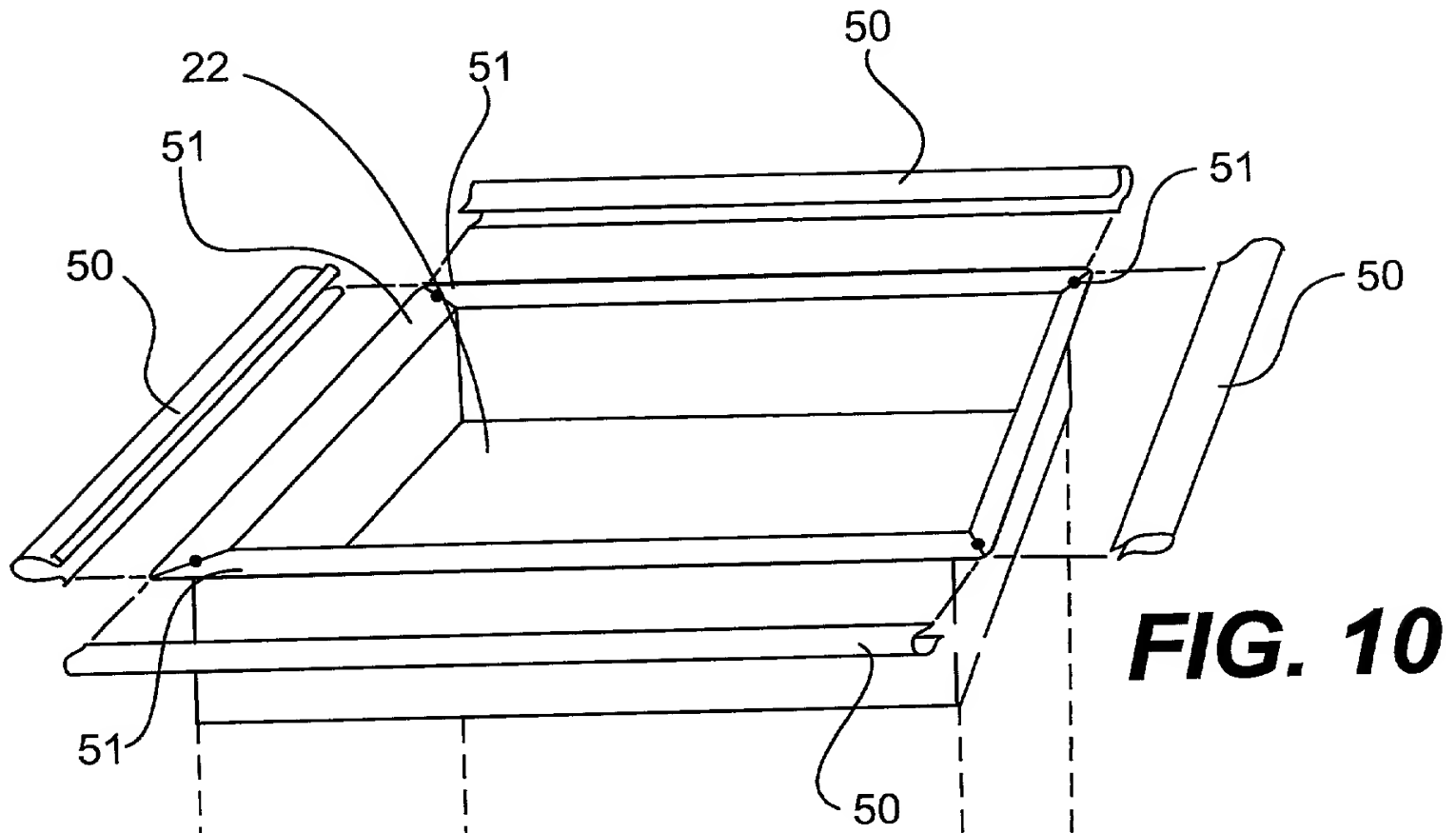
**FIG. 7**

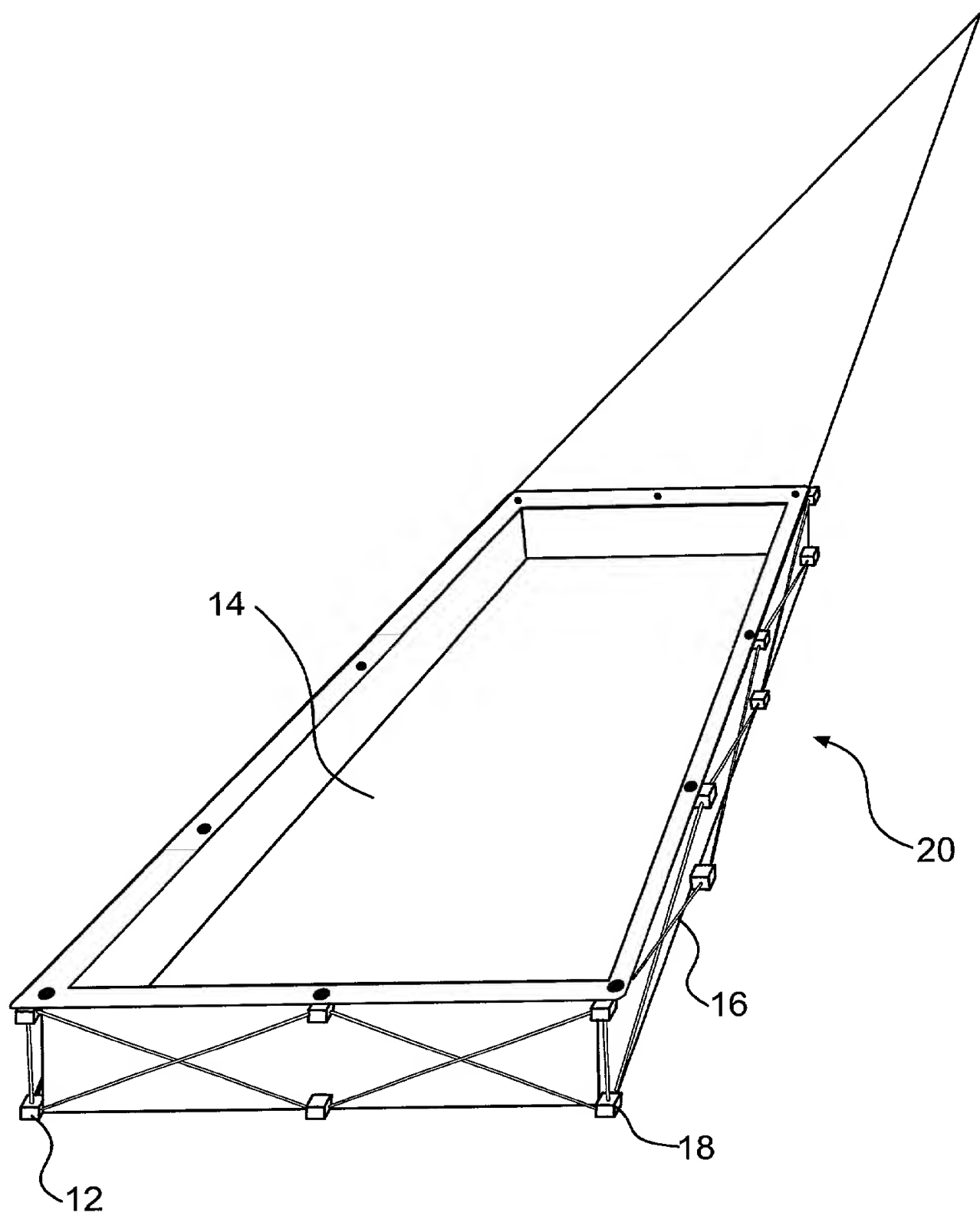
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**FIG. 9**





**FIG. 12**

**DECLARATION AND POWER OF ATTORNEY**

As a below named inventor, I hereby declare that my residence, post office addresses and citizenships are as stated below next to my name; I believe I am the original, first, and sole inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled: RAPID DEPLOY HAZMAT CONTAINMENT DEVICE, the specification of which is attached.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, so amended by any amendment referred to above. I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR § 1.56.

I hereby claim foreign priority benefits under 35 U.S.C. § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate or § 365(a) of any PCT International application(s) designating at least one country other than the United States, listed below and have also identified below, any foreign application(s) for patent or inventor's certificate, or any PCT International application(s) having a filing date before that of the application(s) of which priority is claimed:

Country	Application Number	Date of Filing	Priority Claimed Under 35 U.S.C. 119
			<input type="checkbox"/> YES <input type="checkbox"/> NO

I hereby claim the benefit under 35 U.S.C. § 119(e) of any United States provisional application(s) listed below:

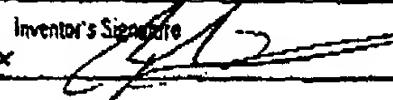
Application Number	Date of Filing
60/159,507	October 15, 1999

I hereby claim the benefit under 35 U.S.C. § 120 of any United States application(s) or § 365(c) of any PCT International application(s) designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application(s) in the manner provided by the first paragraph of 35 U.S.C. § 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR § 1.56 which became available between the filing date of the prior application(s) and the national or PCT International filing date of this application:

Application Number	Date of Filing	Status (Patented, Pending, Abandoned)

I hereby appoint the following attorney and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith: FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER, L.L.P., Douglas B. Henderson, Reg. No. 20,291; Ford F. Farabow, Jr., Reg. No. 20,630; Arthur S. Garrett, Reg. No. 20,338; Donald R. Dunner, Reg. No. 19,073; Brian G. Brunswald, Reg. No. 22,593; Tipton D. Jennings, IV, Reg. No. 20,645; Jerry D. Voight, Reg. No. 23,020; Laurence R. Heffer, Reg. No. 20,827; Kenneth E. Payne, Reg. No. 23,098; Herbert H. Mintz, Reg. No. 26,691; C. Larry O'Rourke, Reg. No. 26,014; Albert J. Santorelli, Reg. No. 22,610; Michael C. Elmer, Reg. No. 25,257; Richard M. Smith, Reg. No. 20,609; Stephen L. Peterson, Reg. No. 26,325; John M. Romary, Reg. No. 26,331; Bruce C. Zoller, Reg. No. 27,680; Dennis P. O'Reilly, Reg. No. 27,932; Allen M. Sokal, Reg. No. 26,631; Robert D. Bajarsky, Reg. No. 25,387; Richard L. Stroup, Reg. No. 28,478; David W. Hill, Reg. No. 28,220; Thomas L. Irving, Reg. No. 28,619; Charles E. Lipsey, Reg. No. 28,165; Thomas W. Winland, Reg. No. 27,605; Basil J. Lewis, Reg. No. 28,818; Martin I. Fuchs, Reg. No. 28,508; E. Robert Yoches, Reg. No. 30,120; Harry W. Graham, Reg. No. 29,924; Susan Haberman Griffen, Reg. No. 30,907; Richard S. Racine, Reg. No. 30,415; Thomas H. Jenkins, Reg. No. 30,857; Robert E. Converse, Jr., Reg. No. 27,432; Clair X. Rullien, Jr., Reg. No. 20,348; Christopher P. Foley, Reg. No. 31,354; Jenn C. Paul, Reg. No. 30,413; Roger D. Taylor, Reg. No. 28,992; David M. Kelly, Reg. No. 30,953; Kenneth J. Meyers, Reg. No. 25,146; Carol P. Einlaudi, Reg. No. 32,220; Walter Y. Boyd, Jr., Reg. No. 31,738; Steven M. Anzalone, Reg. No. 32,095; Jean B. Fordis, Reg. No. 32,984; Barbara C. McCurdy, Reg. No. 32,120; James K. Hammond, Reg. No. 31,964; Richard V. Burgujian, Reg. No. 31,744; J. Michael Jakes, Reg. No. 32,824; Dirk D. Thomas, Reg. No. 32,600; Thomas W. Banks, Reg. No. 32,719; Christopher P. Isaac, Reg. No. 32,616; Bryan C. Diner, Reg. No. 32,409; M. Paul Barker, Reg. No. 32,013; Andrew Chanho Sonu, Reg. No. 33,457; David S. Forman, Reg. No. 33,694; Vincent P. Kovalick, Reg. No. 32,867; James W. Edmondson, Reg. No. 33,871; Michael R. McGuirk, Reg. No. 32,045; Joann M. Neuh, Reg. No. 36,363; Gerson S. Panitch, Reg. No. 33,751; Cheri M. Taylor, Reg. No. 33,216; Charles E. Van Horn, Reg. No. 40,266; Linda A. Wadler, Reg. No. 33,218; and Parmanand K. Sharma, Reg. No. 43,916. Please address all correspondence to FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER, L.L.P., 1300 I Street, N.W., Washington, D.C. 20005, Telephone No. (202) 408-4000.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

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Listing of Inventors Continued on Page 2 hereof. ☒ No